Board these lectures were afterwards published, and they have since formed an important portion of the course of study required for the College examinations. For some time it was universally felt that the book was not in keeping with the advanced state of astronomical science, and that a new and revised edition was necessary. For this purpose, the authorities of Trinity College, who naturally have a traditional respect for this treatise, were fortunate in securing so accomplished an editor as Dr. Stubbs, and the co-operation of so distinguished an astronomer as Dr. Brünnow.

Seekers after the romance and history of astronomy will find in this volume few facts recorded in this interesting branch of the science, which the editors have apparently rightly considered as forming no part of a college text-book, for "the student who has made himself so well acquainted with astronomy as to find its history interesting will easily procure for himself, from a variety of authors, all the information he can desire." There is also a very limited amount of description of the physical aspects of the larger planets. We rather regret this omission, although there may be reason for doing so, for we believe that the book would have been more generally attractive and useful had some of the results of the numerous modern observations of the physical features of Mars, Jupiter, and Saturn been given. This treatise contains, however, what is far more valuable in a text-book, and which is often slurred over in many popular astronomical works of much higher pretensions, clear and concise explanations, accompanied in many instances with the formulæ of reduction, of various astronomical subjects. Among them we may name the theories of refraction and parallax, the phenomena depending on a change of position on the earth's surface, the motions of the moon and planets in their orbits, eclipses of the sun and moon, the application of astronomy to navigation and geography, the figure of the earth, the masses of the sun and planets, &c. A very fair description of the construction and use of the transit instrument, mural circle, and equatorial is also given, sufficient in fact to enable a non-practised but intelligent observer to understand easily the necessary adjustments required in the use of these instruments. There is an omission, however, though we could scarcely expect to find it inserted, as the method is only adopted in a few of the principal observatories, but a notice of which we are inclined to think would have been acceptable to many, and would doubtless increase the value of the section on astronomical instruments. We refer to the method of automatic registration of transits on a chronograph, instead of recording them by the ordinary or "eye and ear" method. It is true that the usual manner of making a transit is sufficiently explained, but as the chronographic registration is now frequently adopted in the determination of the differences of terrestrial longitudes, as well as in the ordinary registration of transits, we shall always be glad to see a description of the chronograph in every treatise on practical astronomy.

Besides considerable alterations in the arrangement of the subjects and additions to the text made by Dr. Stubbs, Dr. Brünnow has contributed new chapters on the physical constitution of the sun and heavenly bodies, on discoveries made by means of the spectroscope, on the proper motions of the fixed stars, and on the general advance of stellar astronomy. We need not remark more on these chapters than that the great astronomical reputation of Dr. Brünnow is a sufficient guarantee of their accuracy, and to observe that the principal results of the recent researches are given in a concise form, which makes these chapters most interesting as well as valuable reading.

We have hitherto given to this excellent treatise an almost unqualified approval, but there are one or two points of no great moment which we should like to see corrected in a future edition. Nothing offends the eye of an astronomer more than to see in an astronomical text-book errors in the orthography of well-known proper names. We have detected a few of such errors which ought to have attracted the attention of the editors if not of the printer. "Flamstead" for *Flamsteed* might reasonably be passed over in silence; but when we see "Faumalhaut" printed for *Fomalhaut*, "Fourcault," more than once, for *Foucault*, "Leomis" for *Loomis*, "Maskeline," more than once, for *Maskelyne*, we cannot avoid feeling a pang of regret that in an educational work on the science such inaccuracies should have been allowed to pass. Again, it is unfortunate that greater care was not taken to correct the distances and magnitudes of the members of the solar system, depending upon the recent alteration of the value of the solar parallax, especially as the new value of the sun's distance in miles is frequently given. The old value in miles for the velocity of light per second, 192,000, might also have been corrected for the same reason. On page 152, the value of the solar parallax determined from Foucault's experiment is 8″·86, *not* 8″·942, this latter value being sensibly the same as that determined finally by Mr. Stone from a comparison of the Greenwich observations of Mars at the opposition in 1862, with the corresponding observations made by Sir Thomas Maclear at the Cape and by Mr. Ellery at Williamstown, Australia.

Notwithstanding these few slight drawbacks, we do not hesitate to recommend this most excellent treatise, which is moderate in price, to all who are interested in astronomical observations and in the progress of astronomy.

OUR BOOK SHELF

A Peep at Mexico. By John Lewis Geiger, F.R.G.S. (London: Trübner and Co., 1874.)

MR. GEIGER'S book is chiefly devoted to a description of the not well known country westward of the town of Mexico. The route of his journey was from Manzanillo, on the coast of the Pacific, *viâ* Colima, Zacoalco, Guadalajara, Guanajuato, and Querétaro, to the capital.

The book gives but a "peep" at Mexico, but it is a very agreeable one; for, not entirely relying on his pen to describe what he saw, the author photographed *en route*, and forty-five views illustrate his book. Although the people, their habitations, and their ways, are the principal topics on which Mr. Geiger writes, yet here and there he gives glimpses of the natural history of the country. For example, the first part of his journey from Manzanillo was along the Laguna de Cuyutlan, which runs parallel with the shore, separated from the ocean by only a narrow strip of land. "It is almost completely enclosed by mangrove jungle, which overruns the banks and creates numerous islets by its growth where the water is shallowest. . . . There is no

variety in the vegetation; mangroves monopolise all available space." The stagnant waters he describes as covered with a brownish green slime, disturbed occasionally by an alligator.

"Some spots were literally crowded with numerous varieties of ducks and teal. . . . Their cackling would often alarm a company of huge white cranes, quietly congregated on a sandbank. . . .

"On the floating islands, proud storks and sedate melancholy herons were engaged in catching and consuming their breakfast, whilst every nook of the mangrove thickets, every shallow in the lake, every log of wood on the water, was tenanted by all manner of birds, including alike the busy wagtail, the grandfatherly pelican, and the stately flamingo. As we cut the placid waters, a brace of neat sand-pipers or a swift kingfisher, scared by the snort of the engine, would suddenly emerge from the margin of the channel, and, darting ahead, be again frightened into the air almost before they had settled.

"Soaring in graceful circles far overhead, a variety of hawks view the scene from aloft, ready to pounce upon whatever appears an easy prey; whilst thousands of dark-blue glittering swallows hurry from island to island, feeding plenteously on the myriads of insects that hover above the water."

The vegetation near Colima is thus described:—

"The trees are not large, but are so interwoven as to form impassable barriers, even apart from the bushes and shrubs that spring from every spot of vacant ground. Hundreds of creepers cling to every trunk, and twine round every branch, connecting by a thousand wiry threads, thickets, shrubs, and cacti—a massive bulwark of profuse vegetation, through which the axe alone can hew a way. The huge *Organo* cactus, with its tree-like stem, often 2 ft. in diameter, and 10 ft. to 15 ft. high, sends up its stiff, straight branches to a height of 30 ft. or 40 ft. from the ground, whilst the smaller species mingle in thousands with the shrubs and bushes nearer the earth. Wherever the creepers may have neglected trunk or bough, prolific parasites, gay alike with taper leaf and gorgeous blossom, hasten to perform their part in this fairy work of nature. The flowers have little scent, but their profusion of white, yellow, and red, blended with the countless shades of green, charm the eye with tints as various as they are magnificent."

Beyond the fact of mentioning lava near Colima, Mr. Geiger has made no attempt to give any geological information, and the principal physical feature noticed is that the country is much broken up by *barrancas*, narrow ravines, which sadly interfere with the making of straight roads. The book is full of interesting information about social life.

Les Roses:—Histoire; Culture; Description. Par Hippolyte Jamain et Eugène Forney; préface par Ch. Naudin. 60 chromolithographies d'après nature, par Grobon. 2me edition. (Paris: J. Rothschild.)

LIKE so many of our garden-flowers, the history of most of our cultivated varieties of the rose is involved in obscurity. A few species, as *Rosa centifolia* (the Cabbage Rose), *gallica*, *damascena* (the Damask Rose), *moschata* (the Moss Rose), *lutea* (the Yellow Rose), have retained their distinguishing characters; but the majority of the florist's flowers are the result of hybridisation or variation, in which all trace of their nativity is lost. The same is the case also in Western Asia, the rose which yields the famous attar of roses being of very doubtful origin, probably a form of *R. damascena*. In the work before us we have a history of the cultivation of the rose, followed by a description of the various species and varieties, with their geographical distribution; an account of the various modes of cultivation; and a history of the diseases and insect enemies to which it is liable—all embellished with very beautifully executed woodcuts. The greater part of this handsome volume is occupied by sixty chromolithographs of well-known roses, which are triumphs of the engraver's art. The colours are so truthful, and the execution so clear and brilliant, that even in engravings coloured by hand you could scarcely obtain more accurate or beautiful illustrations. The volume is one that deserves a place on every drawing-room table.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*]

Dr. Petermann's Letters to the Presidents of the Royal Geographical Society in 1865 and 1874

THE letter from Dr. Petermann to the President of the Royal Geographical Society, dated Nov. 7, 1874,* refers to what took place ten years ago, and to the two letters which he then addressed to Sir Roderick Murchison on the subject of arctic exploration, a subject on which he then, as now, assumed for himself the right of speaking as an authority. There are many geographers who feel very strongly that Dr. Petermann did great injury to the cause of arctic discovery in 1865, and it seems desirable that as he has again put himself forward as an authority, his pretensions to that character should be examined.

Captain (now Admiral) Sherard Osborn read an exhaustive paper before the Royal Geographical Society on Jan. 22, 1865, in which he advocated a renewal of arctic exploration by the route of Smith Sound. The long series of voyages in the direction of Spitzbergen had proved, by a process of induction, that the Smith Sound route was the one that should be followed; while the development, during the Franklin searches, of that system of sledge travelling with which the name of M'Clintock is associated, caused a revolution in the method of exploring, and must be looked upon in the light of a discovery. From that time it has been known that land must be the basis of polar exploration, that a real advance can only be made by following the land-ice, and that sending ships into the drifting packs between Greenland and Novaya Zemlya is a useless waste of time and money. Sir George Back, Admiral Collinson, Sir Leopold M'Clintock, Admiral Sherard Osborn, Captain Vesey Hamilton, and other arctic officers practically acquainted with the subject held that view in 1865, and they hold it now. Their opinions were based on practical experience and on the records of former voyages, and nothing has occurred since either to alter or to modify them.

Admiral Osborn's proposal was cordially supported, and there appeared to be good reason to expect that it would be unanimously accepted; when two letters from Dr. Petermann to Sir Roderick Murchison, by causing a useless and barren discussion, had the effect of destroying these fair prospects.

Dr. Petermann has no practical knowledge whatever of the arctic regions. He is famous for having propounded a theory more than twenty years ago, and he has ever since striven to make the obstinate facts fit into it—a hopeless task. So that while he has no actual acquaintance with the polar regions, the exigencies of his theory prevent him from judging of what he reads with an unbiassed mind. It was in January 1852 that the Petermann theory was first given to the world, in the form of a "Plan of Search for Sir John Franklin." The theory is that there is an open sea round the pole, caused by the Gulf Stream, and that it can be reached late in the autumn with perfect ease, by sailing north between Spitzbergen and Novaya Zemlya. He urged that Franklin's ships were beset near the coast of Siberia, and that the way to reach them was by sailing across the polar ocean during the winter.

This is the Petermann theory. It might have been very mischievous in 1852, by diverting the search from the proper direction; but fortunately it was considered absurd, and received little or no attention. Unluckily for the cause of arctic research, Dr. Petermann resuscitated his theory in a modified form, in his two letters to Sir Roderick Murchison, in which he advocated the Spitzbergen route in 1865.

Dr. Petermann assigned eight reasons for his preference, which are easily disposed of. His first reason was that the voyage from England to the North Pole is shorter by Spitz-

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